

CLAIMS

1. A thin film forming method comprising:
a surfactant film forming step of forming a film including a surfactant on a surface of a substrate;
a vapor deposition step of causing the substrate to come in contact with a gas phase containing a silica derivative to form a thin film including the silica derivative; and
a step of calcining the substrate having the thin film formed thereon and decomposing and removing the surfactant, the thin film being thus formed.
2. The thin film forming method according to claim 1, wherein the vapor deposition step serves to form a thin film including a silica derivative having a siloxane skeleton and a surfactant and including a silica derivative having a pore arranged periodically.
3. The thin film forming method according to claim 1 or 2, wherein the vapor deposition step is executed at a substrate temperature of 180°C or more.
4. The thin film forming method according to any of claims 1 to 3, wherein the decomposing and removing step includes a step of carrying out calcining at 300 to 400°C.
5. The thin film forming method according to any of claims 1 to 4, further comprising:
a surfactant film forming step of coating and forming a film including a surfactant on a surface of a semiconductor substrate having a desirable device region formed thereon;
a vapor deposition step of forming a silica derivative thin film by an exposure to a TEOS atmosphere while maintaining the semiconductor substrate at a desirable set temperature; and
a step of calcining the substrate having the silica derivative thin film formed thereon and decomposing and removing the surfactant, the thin film being thus formed.
6. The thin film forming method according to any of claims 1 to 5, wherein the decomposing and removing step serves to form a thin film having a porosity of 50% or more.
7. The thin film forming method according to any of

claims 1 to 5, wherein the decomposing and removing step serves to form an inorganic dielectric thin film having a porosity of 50% or more.

8. The thin film forming method according to any of claims 1 to 7, wherein the decomposing and removing step serves to form, on the surface of the substrate, a thin film including a pore having an orientation.